



24 – 36 months (Typically Nursery 1)	36 – 48 months (Typically Nursery 2)	48 – 60 / 60-71 months (Typically Reception)
<ul style="list-style-type: none"> <li>➤ Explore natural materials, indoors and outside.</li> <li>➤ Use all their senses in hands-on exploration of natural materials.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Begin to understand the need to respect and care for the natural environment and all living things.</li> <li>➤ Understand the key features of the life cycle of a plant and an animal</li> <li>➤ Plant seeds and care for growing plants</li> <li>➤ Explore collections of materials with similar and/or different properties.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Explore the natural world around them.</li> <li>➤ Describe what they see, hear and feel whilst outside.</li> <li>➤ Recognise some environments that are different to the one in which they live.</li> <li>➤ Understand the effect of changing seasons on the natural world around them.</li> </ul>

#### EARLY LEARNING GOALS 2021

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

#### KEY STAGE ONE

##### Pupils should be taught

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment
- perform simple tests
- identify and classifying
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions.

#### KEY STAGE TWO

##### Pupils should be taught

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- Use straightforward scientific evidence to answer questions or to support their findings.

## SKILLS AND UNDERSTANDING BREAKDOWN FOR WORKING SCIENTIFICALLY

### KS1

KS1	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry				
Classifying	Be able to ask a Yes/No questions to aid sorting	Identify the headings for the two groups (it is ....., it is not .....)	Be able to compare objects based on obvious, observable features e.g. size, shape, colour, texture etc.			Sort objects and living things into two group using a basic Venn diagram or simple table	Talk about the number of objects in each group i.e. which has more or less	Children in KS1 are not expected to draw conclusions. They are expected to make observations which will help them to answer questions. They do not have the subject knowledge to give reasons for what they observe so they cannot draw scientific conclusions.	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen, but this will be based on experience or may simply be a guess.	Children in KS1 are not expected to evaluate. However, children should be encouraged to consider their method and adapt this where necessary.				
	Researching	Ask one or two simple questions linked to a topic				Present what they have learnt verbally or using pictures	Be able to answer their questions using simple sentences							
Comparative/fair testing	Identify the question to investigate from a scenario or choose a question from a range provided	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question	Make observations linked to answering the question	When appropriate, measure using standard units where all the numbers are marked on the scale	Record data in simple prepared tables, pictorially or by taking photographs	Present what they learnt verbally, using pictures or block diagrams	Answer their question in simple sentences using their observations or measurements							
	Observing over time										Ask a question about what might happen in the future based on an observation		Record data in simple prepared tables, pictorially or by taking photographs	Present what they learnt verbally or using pictures
	Pattern seeking										Ask a question that is looking for a pattern based on observations		Record data in simple, prepared tables and tally charts	Present what they learnt verbally

## SKILLS AND UNDERSTANDING BREAKDOWN FOR WORKING SCIENTIFICALLY

### LKS2

LKS2	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classifying	Be able to ask a range of Yes/No questions to aid sorting	Be able to put appropriate headings onto intersecting Venn and Carroll diagrams	Be able to compare objects based on more sophisticated, observable features. Present observations in labelled diagrams.			Sort objects and living things into groups using intersecting Venn and Carroll diagrams	Spot patterns in the data particularly two criteria with no examples e.g. there are no living things with wings and no legs	Draw simple conclusions, when appropriate, for patterns e.g. a flying insect with no legs might always crash land		Suggest improvement e.g. a wider range of objects – only looked at British trees. Suggest new questions arising from the investigation.
Researching	Ask a range of questions linked to a topic	Choose a source from a range provided				Present what they learnt verbally or using labelled diagrams and explanations	Be able to answer their questions using simple scientific language			Suggest limitations e.g. only had one book. Suggest new questions arising from the investigation.
Comparative/fair testing		Decide what to change and what to measure or observe	Make observations linked to answering the question	Measure using standard units where not all the numbers are marked on the scale, and take repeat readings where necessary	Prepare own tables to record data	Present data in bar charts on simple prepared axis.	Refer directly to their evidence when answering their question	Where appropriate provide oral or written explanations for their findings	Use results from an investigation to make a prediction about a further result	Suggest improvements e.g. to method of taking measurements. Suggest new questions arising from the investigation.
Observing over time		Decide what to measure or observe. Decide how often to take a measurement.	Make a range of relevant observations	Measure using standard units where not all the numbers are marked on the scale.		Present data on a table  Create a whole class time graph using ICT				
Pattern seeking		Decide what to measure or observe	Make observations linked to answering the question	Measure using standard units where not all the numbers are marked on the scale.		Use ICT package to present data as a bar chart, line graph or pie chart.				

# SKILLS AND UNDERSTANDING BREAKDOWN FOR WORKING SCIENTIFICALLY

## UKS2

UKS2	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather/record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
<b>Classifying</b>	Be able to ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information	Identify specific clear questions that will help to sort without ambiguity	Be able to compare not only based on physical properties but also on knowledge gained through previous enquiry			Create branching databases (tree diagrams) and keys to enable others to name living things and objects	Be able to talk about the features that objects and living things share and do not share based on the information in the key etc.	Be able to use data to show that living things and materials that are grouped together have more things in common than with things in other groups		Be able to explain using evidence that the branching database or classification key will only work for the living things or materials it was created for
<b>Researching</b>	Ask a range of questions recognising that some can be answered through research and others may not	Choose suitable sources to use				Present what they learnt in a range of ways e.g. different graphic organisers	Be able to answer their questions using scientific evidence gained from a range of sources			Be able to talk about their degree of trust in the sources they used
<b>Comparative/fair testing</b>	Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results.	Recognise and control variables where necessary	Make observations linked to answering the question	Measure using standard units using equipment that has scales involving decimals	Prepare own tables to record data, including columns for taking repeat readings	Choose an appropriate form of presentation, including line graphs	Be able to answer their question, describing causal relationships	Provide oral or written explanations for their findings	Use test results to make predictions for further investigations	Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled, and accuracy of results
<b>Observing over time</b>							Be able to answer their questions, describing the change over time			
<b>Pattern seeking</b>							Choose an appropriate form of presentation.			

**KNOWLEDGE BREAKDOWN FOR SCIENCE**

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Animals Including Humans</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• Make observations of animals and explain why some things occur, and talk about change.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals;</li> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores;</li> <li>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets);</li> <li>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• notice that animals, including humans, have offspring which grow into adults;</li> <li>• find out about and describe the basic needs of animals, including humans, for survival (water, food and air);</li> <li>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat;</li> <li>• identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• describe the simple functions of the basic parts of the digestive system in humans;</li> <li>• identify the different types of teeth in humans and their simple functions;</li> <li>• construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• describe the changes as humans develop to old age.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood;</li> <li>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function;</li> <li>• describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>
<b>Plants</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• Make observations of plants and explain why some things occur, and talk about change.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees;</li> <li>• identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• observe and describe how seeds and bulbs grow into mature plants;</li> <li>• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers;</li> <li>• explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant;</li> <li>• investigate the way in which water is transported within plants;</li> <li>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</li> </ul>			

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things and Their Habitats	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• Talk about the features of their own immediate environment and how environments might vary from one another.</li> </ul>		<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• explore and compare the differences between things that are living, dead, and things that have never been alive;</li> <li>• identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</li> <li>• identify and name a variety of plants and animals in their habitats, including microhabitats;</li> <li>• describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</li> </ul>		<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• recognise that living things can be grouped in a variety of ways;</li> <li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment;</li> <li>• recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird;</li> <li>• describe the life process of reproduction in some plants and animals.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals;</li> <li>• give reasons for classifying plants and animals based on specific characteristics.</li> </ul>
Evolution and Inheritance							<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago;</li> <li>• recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents;</li> <li>• identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• Look closely at similarities, differences, patterns and changes in nature.</li> </ul>	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• observe changes across the 4 seasons;</li> <li>• observe and describe weather associated with the seasons and how day length varies.</li> </ul>					
Forces				<p><b>Forces and Magnets</b></p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• compare how things move on different surfaces;</li> <li>• notice that some forces need contact between 2 objects, but magnetic forces can act at a distance;</li> <li>• observe how magnets attract or repel each other and attract some materials and not others;</li> <li>• compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials;</li> <li>• describe magnets as having 2 poles;</li> <li>• predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</li> </ul>		<p><b>Forces</b></p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object;</li> <li>• identify the effects of air resistance, water resistance and friction, that act between moving surfaces;</li> <li>• recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</li> </ul>	



	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light				<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• recognise that they need light in order to see things and that dark is the absence of light;</li> <li>• notice that light is reflected from surfaces;</li> <li>• recognise that light from the sun can be dangerous and that there are ways to protect their eyes;</li> <li>• recognise that shadows are formed when the light from a light source is blocked by an opaque object;</li> <li>• find patterns in the way that the size of shadows change.</li> </ul>			<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines;</li> <li>• use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye;</li> <li>• explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes;</li> <li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>
Sound					<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating;</li> <li>• recognise that vibrations from sounds travel through a medium to the ear;</li> <li>• find patterns between the pitch of a sound and features of the object that produced it;</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it;</li> <li>• recognise that sounds get fainter as the distance from the sound source increases.</li> </ul>		

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Earth and Space						<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• describe the movement of the Earth and other planets relative to the sun in the solar system;</li> <li>• describe the movement of the moon relative to the Earth;</li> <li>• describe the sun, Earth and moon as approximately spherical bodies;</li> <li>• use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>	
Electricity					<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• identify common appliances that run on electricity;</li> <li>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers;</li> <li>• identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery;</li> <li>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit;</li> <li>• recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>		<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit;</li> <li>• compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches;</li> <li>• use recognised symbols when representing a simple circuit in a diagram.</li> </ul>

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	<p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>Know about similarities and differences in relation to places, objects, materials and living things.</li> </ul>	<p>Everyday Materials</p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>distinguish between an object and the material from which it is made;</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock;</li> <li>describe the simple physical properties of a variety of everyday materials;</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> </ul>	<p>Uses of Everyday Materials</p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses;</li> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul>	<p>Rocks</p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties;</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock;</li> <li>recognise that soils are made from rocks and organic matter.</li> </ul>	<p>States of Matter</p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>compare and group materials together, according to whether they are solids, liquids or gases;</li> <li>observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C);</li> <li>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul>	<p>Properties and Changes of Materials</p> <p><b>Pupils should be taught to:</b></p> <ul style="list-style-type: none"> <li>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets;</li> <li>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution;</li> <li>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating;</li> <li>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic;</li> <li>demonstrate that dissolving, mixing and changes of state are reversible changes;</li> <li>explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul>	